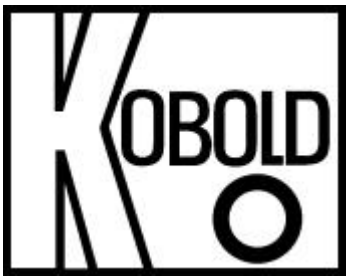
Service Manual

for

Electronic Pressure Switch

Type: PDD



1. Instructions

Please read this service manual carefully before unpacking and setting the unit for operation, and follow the instructions precisely as described.
These devices may only be installed, used and maintained by skilled personnel who are familiar with this service manual and can observe applicable regulations regarding industrial safety and accident-prevention.

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3. Unit Check-up

These devices are checked before despatch and sent away in perfect condition. Should the damage to a device be visible, we recommend a thorough inspection of the delivery packing. In case of damage, please inform your parcel service/ forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

- Electronic pressure switch
- Service manual

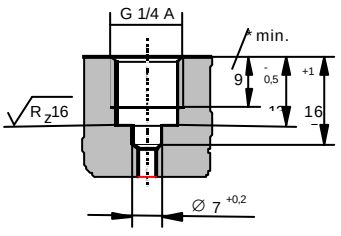
4. Intended Application

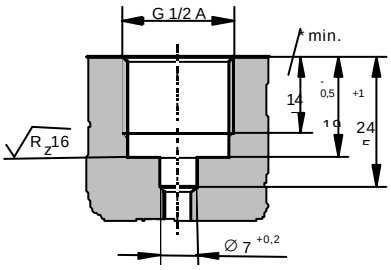
Pressure switches are employed for the regulation and monitoring of pressure in containers, hydraulic and pneumatic systems, and refrigeration technology etc.

5. Mechanical Connection

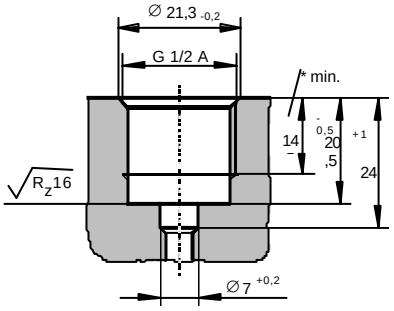
The pressure tappings should be prepared according to the following specification for the screw-in holes.
For the purpose of sealing, disc-sealing (DIN 16 258) or profile sealing may be an adequate choice. The correct torque depends on material and form of the used sealing, as well as on the pressure connection of pressure sensor.
The mounting place should be free from strong vibrations and radiant heat.
The admissible site conditions of pressure sensors are to be maintained.
After making pressure connection and electrical connection, the sensors are ready for use.

Sealing (DIN 16288)





Flat sealing



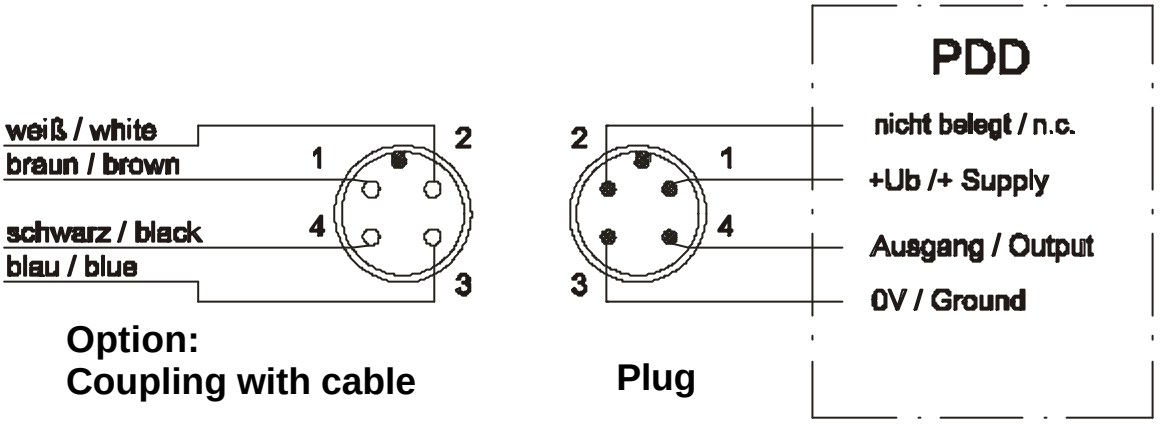
6. Electrical Connection

Attention! Ensure that the voltage levels of your supply system are in agreement with the voltage levels given on this manual.

- Make sure that the electric supply lines are not active.
- The connection is via a plug M 12x1, as shown below.
- Matching couplings with different cable-lengths are available optionally.

Warning! A false connection can lead to the destruction of unit.

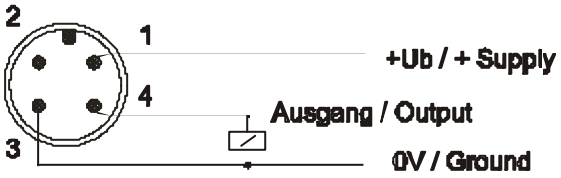
Plug connections



Option:
Coupling with cable

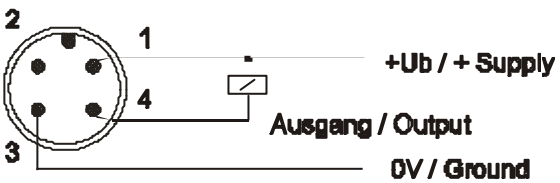
Plug

PNP connection scheme



Plug

NPN connection scheme



Plug

7. Commissioning

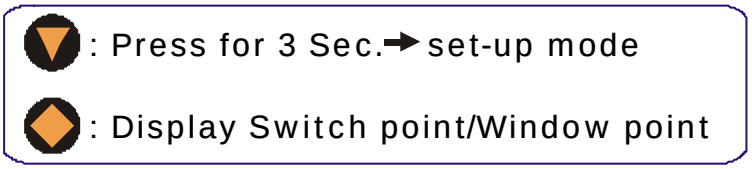
Attention! Please take note that during operation at high temperatures, the surface and the elements within the unit may become very hot!

Connect the pressure switch according to the figure shown on the previous page, and supply the device with the specified voltage.

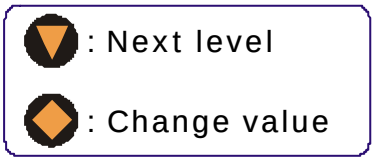
After switching the unit on, the measuring range (full scale) is displayed for 3 seconds.

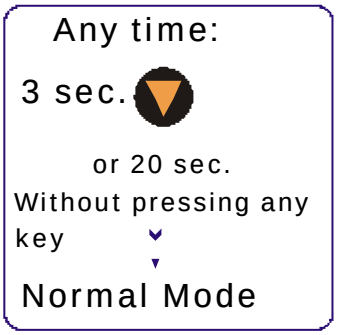
7.1. Function Keys

In Normal mode (Measuring mode)



In set up mode





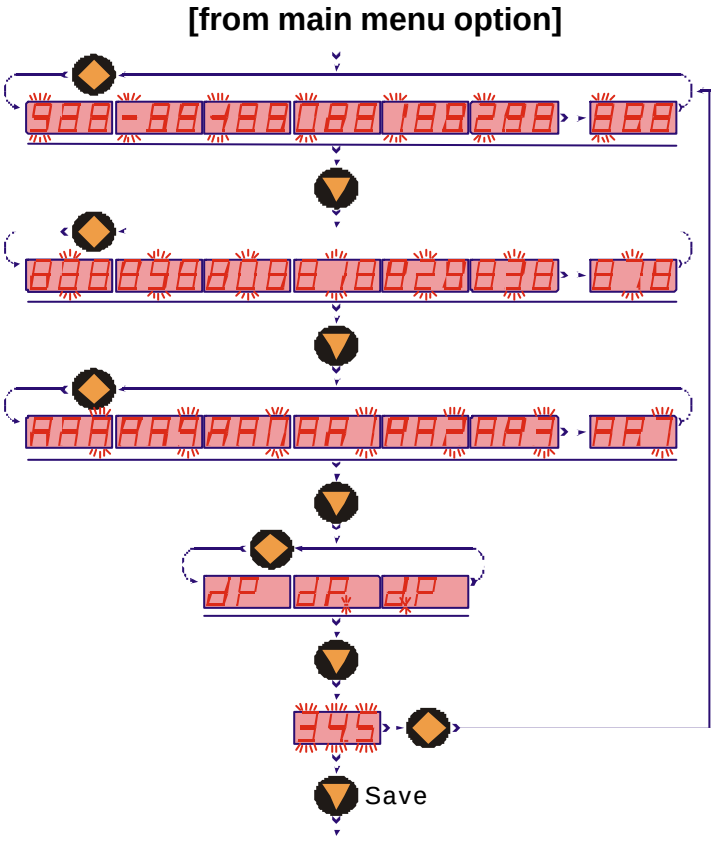
8. Set-up

The Following parameters may be changed:

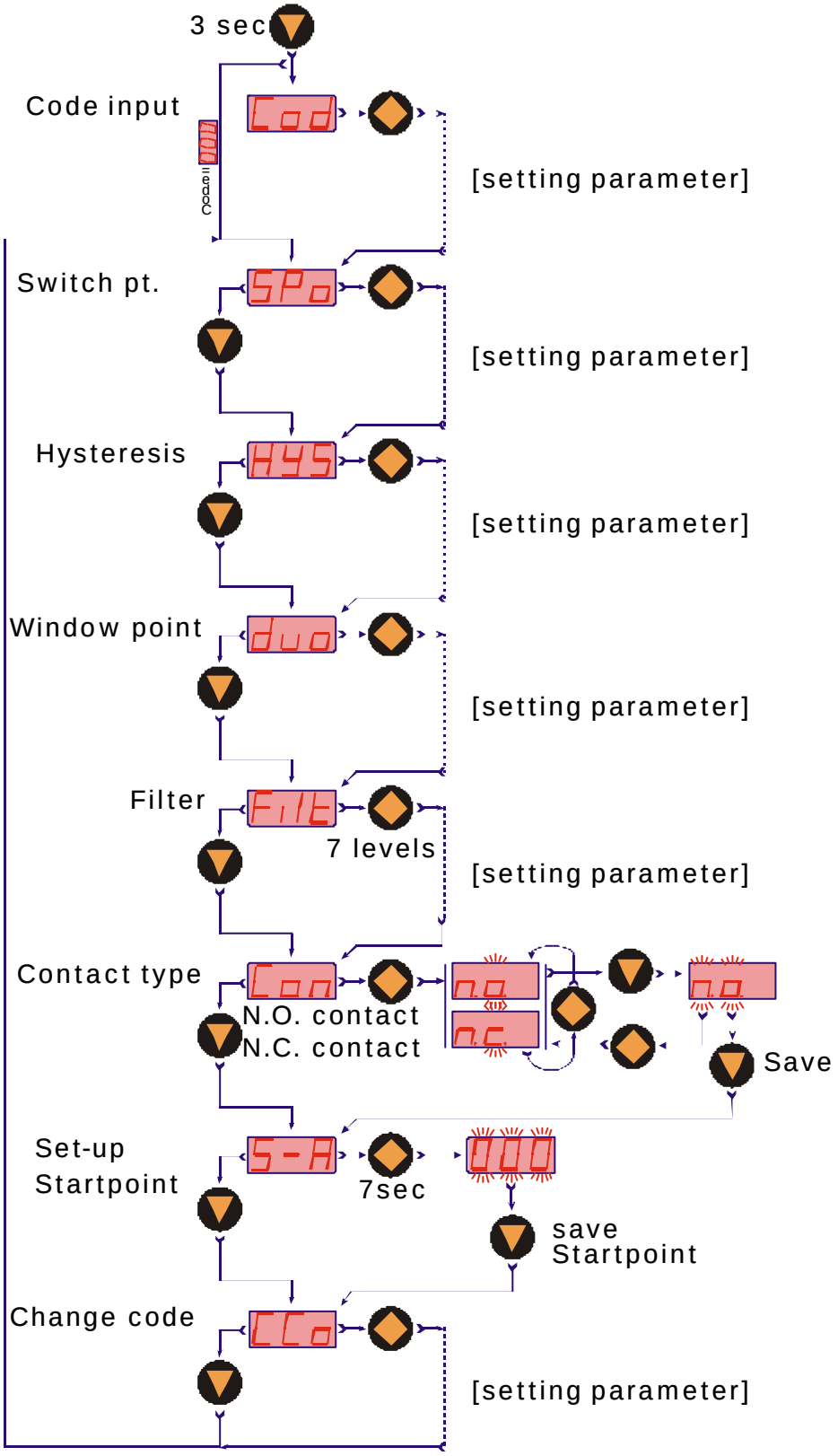
	Display range	**Standard factory pre-sets**
Switch point (**SPo**)	-199...999	0.5 x FS
Hysteresis (**HYS**)	-199...0	000
Window point (**duo**)	Switch point ...999	--- (inactive)
Filter (**Filt**)	1/2/4/8/16/32/64	1
Contact type (**Con**)	(**N.O.**) or (**N.C.**) contact	**N.O.** contact
Null-point (**S-A**, Start adjust)	000	Set to 000
Code (**CCo**, change code)	000...999	000

8.1. Parameter setting

From main menu option (e.g. Switching point, "**SPo**"), press "◆" key in order to go to Parameter set up. The following flow diagram shows the sequence of steps required to change a single parameter.


[from main menu option]
Save
1. Set position
2. Set position
3. Set position
Adjust decimal point
Save selected value or set new value [To next main menu option]

9. Set-up Mode


3 sec
Code input
[setting parameter]
Switch pt.
[setting parameter]
Hysteresis
[setting parameter]
Window point
[setting parameter]
Filter
7 levels
[setting parameter]
Contact type
N.O. contact
N.C. contact
Save
Set-up
Startpoint
7sec
save
Startpoint
Change code
[setting parameter]

10. Main Menu Options

10.1. Switch point

In menu option "**SPo**" the switch point can be set. A value between -199 and 999 can be selected. Additionally, a decimal place can be assigned to this value. The decimal place can be set after the first or the second place (e.g. 10**.**0 or 1**.**00). If the displayed value exceeds or equals the adjusted switch point and the window point is not set, then the switch will be active. An active switch is signalled by the LED beeing lit.
In case the hysteresis is set to zero, then the switch will be inactive if the value is lower than the switch point.

10.2. Hysteresis

After the switch point, an hysteresis "**HYS**" can be entered as a negative value in the menu. The hysteresis default value is zero. However, this can lead to an unwished switching behaviour during the operation, if the measuring signal keep varying around the switch point or the window point. An increase in hysteresis will suppress the effect. The hysteresis refers to both the switch point and the window point (switch point minus hysteresis, window point plus hysteresis).

Example: Switch point 100 bar; Hysteresis: -2.5 bar
The switch will become active at and above 100 bar when the indicated value goes up, and will become inactive at 97.4 bar when the value goes down.

10.3. Window point

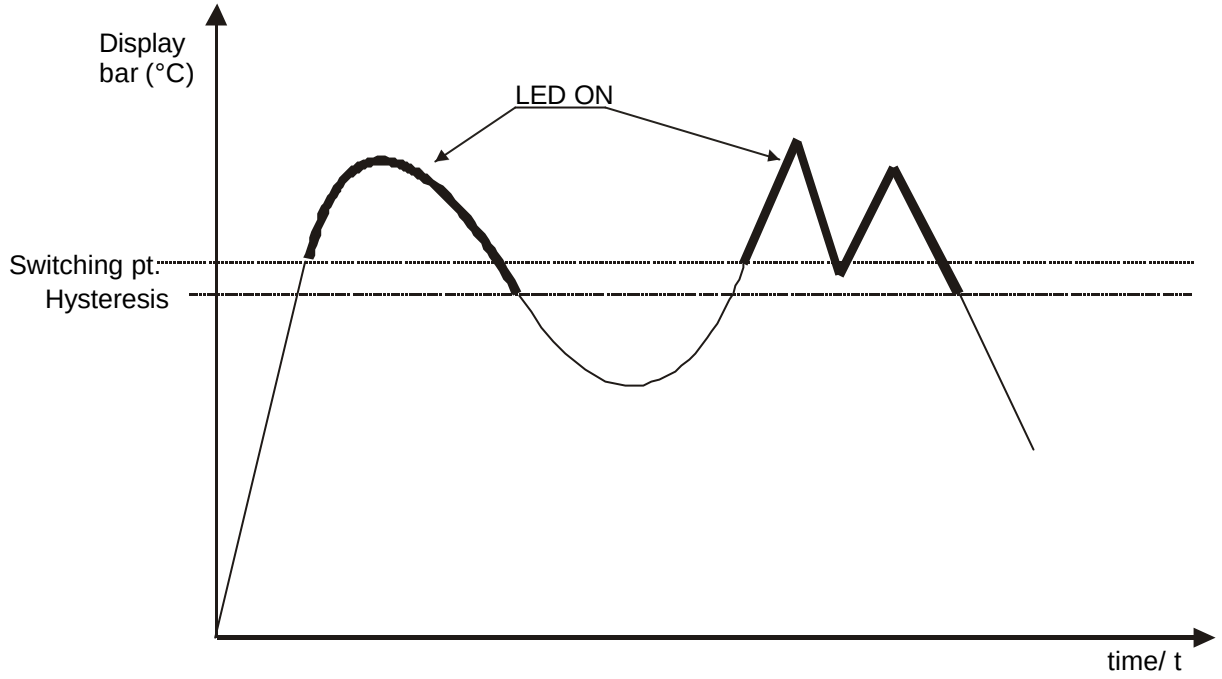
Apart from the switch point a window point ("**duo**") can be defined. It must be larger than the switch point. With both the "window point" and the "switch point" set, the measured value can be monitored within a certain range. If a window point is set, the state of the switch underneath the switch point is similar to the one above the window point.

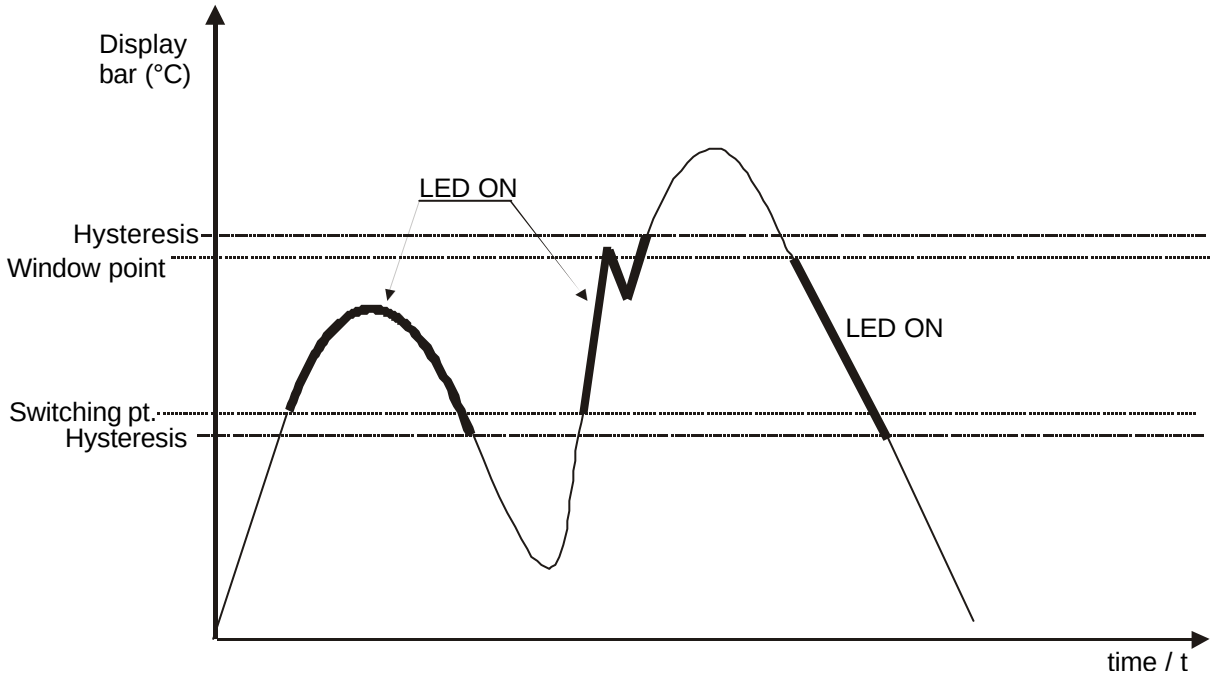
If the window point (duo) is smaller or equal to the switch point, an error message (Er4) is momentarily displayed, afterwards its value is deleted and thus its function becomes ineffective (this is valid for the window point as well as for the switch point setting).

This parameter setting is similar to the switch point setting. The window point is needed for processes, during which the pressure must be monitored within or outside a certain range (see **N.O.** and **N.C.**).
Example: Switch point: 100 bar; Window point: 150 bar; Hysteresis: -1 bar
The switch changes state when pressure exceeds 100 bar. At this moment, if the pressure remains between 99 (100-1) bar and 151 (150+1) bar, the switch remains in the active state (LED on). If the pressure increases crossing 151 bar limit or (decreases to go below 99 bar limit), the switch will revert to an inactive state.

10.4. Switching behaviour

The following diagram clarifies the switching behaviour of the pressure switch. The contact closes (type of contact: N.O.) when exceeding the switch point or falling below the window point. It opens only again after exceeding the window point plus the hysteresis or falling below the switch point minus the hysteresis. An LED signals the switching status of the pressure switch.





10.5. Filter

The filter function "**Filt**" forms a running average from the measured values. The following values can be set (see section 8; set up):

1 / 2 / 4 / 8 / 16 / 32 / 64

They correspond to the number of samples used in the running average. The filter value determines the dynamic behaviour of the display value. The larger the adjusted value, the slower the display response. With a filter value of "**1**" the filter is switched off, i.e. the display value is equal to the unfiltered measured value.

The integrated step function detector reacts to a change of value corresponding to approx. 6.25% of full scale. The moment a step function is detected, the instantaneous measured value is transferred directly to the display and the filter resumes it´s action from that point of time.

10.6. Contact type

In menu option "**Con**" the transistor switching output function is set. The switching function changes from

N.O. contact
to
N.C. contact, and back.

N.O. contact means: Contact closes on exceeding the switch point.
N.C. contact means: Contact opens on exceeding the switch point.

10.7. Set-up start point

In pressure-less state the **Null-point** is calibrated anew in menu option **“S-A“**. For security reasons, the user must press and hold the "◆" key for 7 seconds, in order to set the parameter.

10.8. Code

The function **"CCO"** (change code) is used to protect the device against unauthorised changes to the other parameters. If the code is different from **000**, the user must input the previously set code first in order to make any changes in the set up mode.

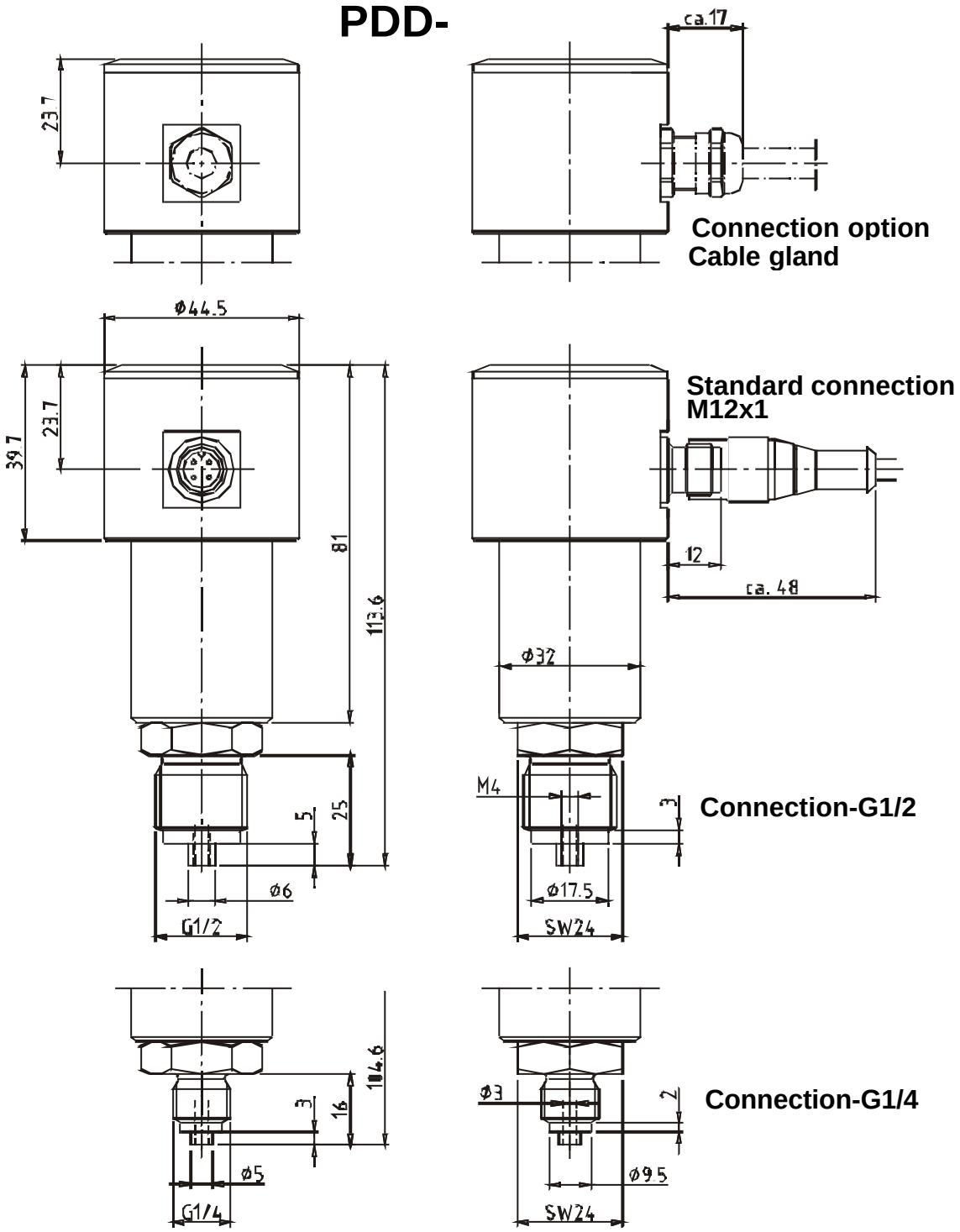
11. Technical Data

Housing cover:	St. Steel 1.4305
Connections:	G 1/4 or G 1/2 male St. Steel 1.4404 Option: 1/4" or 1/2" NPT others on customer's request
Sensor:	monolithic ceramic with Viton O´Ring (option: EPDM; NBR)
Display:	3-digit LED, digit height 7mm
Resolution:	0.01 bar (Meas. value ≤ 9.99 bar) 0.1 bar (Meas. value ≤ 99.9 bar and ≥10.0 bar) 1 bar (Meas. value ≥ 100 bar)
Max. temperatures:	-20...+80°C media -20...+80°C ambient
Permitted over-pressure:	3-times (MB ≤ 60 bar) 2-times(MB ≥ 100 bar)
Power supply:	24VDC ± 20%
Current consumption:	max. 60 mA (no load)
Electrical connection:	plug M12x1 (pins) quick coupling for cable available option: cable connection
Switching output:	Semiconductor PNP or NPN (factory set) max. 300 mA, short-circuit proof
Contact function:	N.O./N.C., Window, adjustable
Switching point setting:	via 2 keys
Switch state indication:	1 LED
Hysteresis setting:	via 2 keys
Meas. cycle:	0.5 sec.
Accuracy:	0.5 % of F.S.
Protection Cat.:	IP 65

12. Maintenance

The device is maintenance-free, when used as described under "Intended Application". Deposits, which develop by contaminated media, could lead to incorrect measured values.

13. Dimensions



14. Declaration of Compliance

We, KOBOLD Messring GmbH, Hofheim/Ts., Federal Republic of Germany declare, that the product

Electronic Pressure Switch, type PDD

is in agreement with the standards listed below:

EN 50081-1 1992
Electromagnetic compatibility - Generic emission standard- Residential, commercial and light industry
EN 50082-2 1995
Electromagnetic compatibility - Generic emission standard -- Part 2: Industrial environment

EN 61010-1 1993
Safety requirements for electrical equipment for measurement, control and laboratory use

Also, the following EWG guidelines are fulfilled:

89/336 EWG

Signature Date: 17.10.00

Harald Peters Manfred Wenzel